

**The Impact of Medical Residents' Exposure to Electronic Medical
Records
Project Analysis Report**

Authors

Gerard Farrell, MD
Director, eHealth Research Unit
Faculty of Medicine, Memorial University of Newfoundland.

Karen Murphy, PhD
Research Manager, Janeway Pediatric Research Unit
Faculty of Medicine, Memorial University of Newfoundland.

George Klima, PhD
St. John's, Newfoundland and Labrador

Ann Hollett, MA
Research Coordinator, eHealth Research Unit
Faculty of Medicine, Memorial University of Newfoundland.

Corresponding author:

Dr. Gerard Farrell
Faculty of Medicine
Room 1775, Health Sciences Centre
300 Prince Philip Drive
St. John's, NL A1B 3V6
Canada
Telephone number: 709-777-8869
Fax number: 709-777-8838
e-mail address: gfarrell@mun.ca

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Review of Relevant Literature

One of the challenges facing those who favour the use of Electronic Health Records (EHR's) is physician adoption of Electronic Medical Records (EMR), the computerized replacement for the doctors' chart. A number of factors, including cost, business process disruption, lack of technology familiarity, and support are commonly cited as reasons why adoption among practicing physicians is slow (Anderson, 2007; Daly, 2006; Miller & Sim, 2004). Many cling to the hope that, as the less technologically inclined begin to retire from practice, the new physicians entering practice will replace them and their paper charts with an EMR.

While Generations X and Y are both much more familiar with technology than most Boomers, the technology they are familiar with is focused on the Web. Most EMR's, even those delivered via the Web, are significantly more complex applications than Facebook or Google. The transferability of skills is not a given. Further, the teaching of students still revolves substantially around documentation on paper; Histories and Physicals are predominantly written documents. Currently exposure to EMRs during medical school is extremely limited. Results from a study involving first year medical students at Memorial University indicate that although experienced in the use of computers, first year medical students did not find the EMR easy to use and they indicated a need for formal training in the use of EMRs (Farrell, Klima, Murphy & Hollett, 2012). The only investigation exploring the integration of EMRs in medical education found that exposure during clerkship is sporadic, inadvertent and unstructured (Ludwick & Doucette, 2009). The ability of EMRs to deliver information in context offers great potential as an educational tool, but to date empirical investigations to explore the possibilities have not been completed. The use of EMRs could significantly alter the daily work of family medicine residents and change how they view the integration of technology into their future practice. However, further investigation is required to determine how it is that early experiences influence family medicine residents' experiences and intentions. No such studies have been conducted. Previous studies of EMR use by residents revealed ambivalence toward EMRs (Aaronson, Murphy-Cullen, Chop, & Frey, 2001; Hier, Rothschild, LeMaistre, & Keeler; 2005; Keenan, Nguyen, & Srinivasan, 2006). Perceived benefits from EMR use among residents included improved access to records, increased and easy access to information for review, improved communications, legibility and accuracy of records, better remote access, improved medication lists, as well as saving time documenting details of care and preventing medical errors. However, perceived shortcomings of EMR systems were also noted and included decreased time with patients, poorer quality physician-patient interactions, increased workload in clinic settings, and slow speed of the EMR systems

Indications in one study were that pediatric and internal medicine residents overwhelmingly felt that the benefits of an EMR outweighed any inconveniences and that EMRs could improve health care delivery (O'Connell, Cho, & Shah, 2004). Another study intended to explore attitudes of residents towards the integration of technology into medical settings revealed that residents are optimistic about the future role of information technology in healthcare and do in fact consistently avail of a broader range of technology than older physicians. However, these residents were also wary about the potential limitations of implementing various technologies into healthcare settings citing issues related to reliability of technologies as well as issues of privacy and security of medical information as real concerns (Parekh, Nazarian, & Lim; 2004). A study by Ilie, Courtney, & Van Slyke (2007) looked at a family practice clinic where physicians and residents are required to use EMRs to retrieve and enter clinical orders. Most residents indicated that if the EMR was not mandatory, they would not have used it. The majority of respondents mentioned that they would use paper if that was an option, both in the clinic and in their future practice. Another study looked at the impact of EMR implementation at a family practice residency clinic on physician perceptions of quality of care, documentation, and work hours, as well as physician productivity. Brotzman et al, (2009) discovered that physician productivity rose with the implementation of the EMR. However, the physicians also perceived the EMR as taking up more of their time. Further research targeting this important group is required to better understand how family medicine residents experience EMRs in various settings throughout their residency and how it is these experiences impact the likelihood that as family physicians they will choose to integrate EMRs into their practice.

An important consideration in any research conducted exploring EMR use is the recognition of differences between vendors. Although some early adopters of EMRs had systems designed to meet their specifications, most care providers rely on commercial vendors for their EMR systems. As advocates push for standards pertaining to the functionality, interoperability, and security of systems, little attention is paid to criteria addressing the usability of EMRs. Such an obvious omission is problematic because ensuring the usability of these systems is integral to integration and adoption in various care settings (Edwards, Moloney, Jacko, & Sainfort, 2008). Ensuring that EMRs are easily used by clinical staff is of utmost importance as the other potential benefits of EMRs will not be realized if users do choose to adopt the technology. An integral part of the proposed study is to determine if family medicine residents' experiences with EMRs provided by different vendors impacts their perceptions of EMRs and their willingness to continue using the technology.

Methodology

Family medicine residents here at Memorial University and at other medical schools in Canada were invited to complete two online surveys determine their perceptions of EMRs in family medicine and to determine if differences are experienced between particular EMR vendors. The Technology Readiness Index (Parasuraman, 2000) was used before their first rotation during their residency and the Electronic Medical Record Post-implementation Survey (Neville, Caison, & Farrell, 2007) was used at the end of the Residents' first year.

Representation from all regions of the country was sought. Contact with each of the medical schools in Canada was made. Schools where EMRs are currently used by family medicine residents were further approached for support of the project. Ethics approval as obtained for the study from six of the institutions originally contacted.

Initial contact with residents was facilitated through the medical schools at each of the universities. Individual family medicine residents were contacted via email with the specific details of the study and its requirements. When consent was obtained before residents completed the online surveys. Correspondence with the participants was largely conducted through emails. Participants were emailed a link to the online survey specifically designed for their medical school. This assured complete anonymity as each was assigned a unique identifier that only indicates the institution with which they are affiliated.

The initial collection of data will use the Technology Readiness Instrument (Parasuraman, 2000) to obtain baseline information regarding the inclination of participants to use and accept technology within their work environments. Then after their first rotation within the family medicine residency program participants were sent another email inviting them to complete the Electronic Medical Record Post-Implementation Survey (Neville, Caison, & Farrell, 2007) which collected data regarding their exposure to EMRs.

Results

Technology Readiness Survey

The technology readiness survey was comprised of the Technology Readiness Index and a short survey on the importance of computers in the work life of a physician.

The Technology Readiness Index (TRI) is a multi-item scale designed to measure the readiness to embrace new technologies (Parasuraman, 2000). This study used an adapted version of the index which was comprised of 37 5-point Likert scale items (1 = ‘strongly disagree’ to 5 = ‘strongly agree’). Factor analysis of the original index clustered the items into four categories: Optimism (alpha = .78), Innovativeness (alpha = .82), Discomfort (alpha = .79), and Insecurity (alpha = .72).

Seventy-seven family medicine residents from across Canada responded to our invitation to complete the Technology Readiness Survey resulting in 71 complete surveys.

Residents from six universities participated: Memorial University (n = 15), Northern Ontario School of Medicine (n = 4), Queen’s University (n = 28), University of Manitoba (n = 8), University of Saskatchewan (n = 5), and University of Western Ontario (n = 11).

Overall, the residents have a positive attitude towards technology with an overall mean score on the index of 3.19 (n = 71, sd = .30). The analysis of the data has been broken down into the four subscales or factors.

Optimism Subscale

Responses to the items which make up the optimism subscale produced a mean of 3.67 (n = 71, sd = .47) which reflects that these residents have a positive view of technology and how it can help them acquire increased control, flexibility and efficiency in their lives. For example, 69% of respondents either agreed or strongly agreed that “technology gives people more control over their daily lives”. A further 85.7% of respondents agreed or strongly agreed that “technology makes you more efficient in your studies”, while 81.7% agreed or strongly agreed that “technology gives you more freedom of mobility”. Table 1 summarizes the responses to the items in this subscale.

Table 1. Optimism Subscale Responses

Question	N	Mean	SD	D	N	A	SA
Technology gives people more control over their daily lives	71	3.77	--	4 (5.6)	18 (25.4)	39 (54.9)	10 (14.1)
New technologies are much more convenient to use	71	3.72	--	5 (7.0)	17 (23.9)	42 (59.2)	7 (9.9)
You find that technology designed to make life easier usually has disappointing results*	70	2.66	--	34 (48.6)	26 (37.1)	10 (14.3)	--
You prefer to use the most advanced technology available	71	3.34	--	16 (22.5)	22 (31.0)	26 (36.6)	7 (9.9)
You like computer programs that	71	4.18	--	1 (1.4)	6 (8.5)	43 (60.6)	21 (29.6)

allow you to tailor things to fit your own needs								
Technology makes you more efficient in your studies	70	4.13	--	1 (1.4)	9 (12.9)	40 (57.1)	20 (28.6)	
You find new technologies to be mentally stimulating	71	3.70	--	4 (5.6)	21 (29.6)	38 (53.5)	8 (11.3)	
Technology gives you more freedom of mobility	71	4.07	--	--	13 (18.3)	40 (56.3)	18 (25.4)	
Learning about technology can be as rewarding as the technology itself	70	3.11	3 (4.3)	13 (18.6)	32 (45.7)	17 (24.3)	5 (7.1)	
You feel confident that machines will follow through with what you instructed them to do	70	3.33	1 (1.4)	13 (18.6)	21 (30.0)	32 (45.7)	3 (4.3)	
Overall Optimism Subscale Mean	71	3.67	sd .47					

*item is negatively worded and therefore is reverse scored when calculating the overall mean for the scale

Innovativeness Subscale

Today we expect students to be technologically adept and for the most part they are. Responses to the items which make up the innovativeness subscale produced a mean of 3.22 ($n = 70$, $sd = .66$) which indicates that they perceive themselves as being in the middle of the road when it comes to pioneering new technology. The majority of respondents fell within the middle of the scale, selecting either ‘disagree’, ‘neither disagree nor agree’ or ‘agree’ when answering the questions on this subscale. For example, 81.4% of respondents fell on the middle of scale when answering the question; “other people come to you for advice on new technology”, while 95.7% of respondents fell on the middle of the scale when answering “it seems your friends are learning more about the newest technologies than you are”. Responses for some items were however more on the positive end of the scale. Sixty-seven percent of respondents agreed or strongly agreed that they “can usually figure out new technology without help from others”, while 86.7% agreed or strongly agreed that they “are always open to learning new and different technologies”. Table 2 summarizes the responses to the items in this subscale.

Table 2. Innovativeness Subscale Responses

Question	N	Mean	SD	D	N	A	SA
Other people come to you for advice on new technologies	70	2.74	10 (14.3)	23 (32.9)	15 (21.4)	19 (27.1)	3 (4.3)
It seems your friends are learning more about the newest technologies that you are*	70	3.04	1 (1.4)	18 (25.7)	30 (42.9)	19 (27.1)	2 (2.9)
In general, you are among the first in your circle of friends to acquire new technology when it appears	70	2.34	13 (18.6)	31 (44.3)	16 (22.9)	9 (12.9)	1 (1.4)
You can usually figure out new technology without help from others	70	3.56	1 (1.4)	12 (17.1)	10 (14.3)	41 (58.6)	6 (8.6)

You keep up with the latest technological developments in your areas of interest	69	3.28	1 (1.4)	14 (20.3)	23 (33.3)	27 (39.1)	4 (5.8)
You enjoy the challenge of figuring out new technology	69	3.16	3 (4.3)	22 (31.9)	10 (14.5)	29 (42.0)	5 (7.2)
You find you have fewer problems than other people in making technology work for you	69	3.30	1 (1.4)	13 (18.8)	24 (34.8)	26 (37.7)	5 (7.2)
You are always open to learning new and different technologies	68	3.99	--	1 (1.5)	8 (11.8)	50 (73.5)	9 (13.2)
There is no sense trying out new technology when what you have already is working fine*	68	2.32	4 (5.9)	43 (63.2)	17 (25.0)	3 (4.4)	1 (1.5)
Overall Innovativeness Subscale Mean	70	3.22	sd .66				

*item is negatively worded and therefore is reverse scored when calculating the overall mean for the scale

Discomfort Subscale

The discomfort subscale focuses on the respondent's perceived lack of control over technology and their feeling of being overwhelmed by it. Responses to these items produced an overall mean score of 2.77 ($n = 69$, $sd = .46$). These results would lead us to believe that these respondents do not have a strong discomfort with technology, or feel overwhelmed by it. For example: 71.4% of respondents disagreed or strongly disagreed with the statement "the hassles of getting new technology to work for you usually make it not worthwhile". The item "when you get technical support, you sometimes feel as if you are being taken advantage of by someone who knows more than you do" was disagreed or strongly disagreed with by 66.7% of respondents. Fifty-seven percent of respondents also disagreed or strongly disagree with the statement "you get overwhelmed with how much you need to know to use the latest technology". Table 3 summarizes the responses to the items in this subscale.

Table 3. Discomfort Subscale Responses

Question	N	Mean	SD	D	N	A	SA
Technological support lines are not helpful because they don't explain things in terms you understand	68	2.62	1 (1.5)	35 (51.5)	22 (32.4)	9 (13.2)	1 (1.5)
Sometimes you think that technology systems are not designed for use by ordinary people	69	2.88	1 (1.4)	29 (42.0)	17 (24.6)	21 (30.4)	1 (1.4)
There is no such thing as a technology manual that's written in plain language	69	2.72	1 (1.4)	33 (47.8)	20 (29.0)	14 (20.3)	1 (1.4)
When you get technical support, you sometimes feel as if you are being	69	2.35	6 (8.7)	40 (58.0)	17 (24.6)	5 (7.2)	1 (1.4)

taken advantage of by someone who knows more than you do								
You prefer to have the basic model of any technology rather than one with a lot of extra features	68	2.84	2 (2.9)	26 (38.2)	23 (33.8)	15 (22.1)	2 (2.9)	
It is embarrassing when you have trouble with technology while people are watching you	68	2.76	6 (8.8)	27 (39.7)	14 (20.6)	19 (27.9)	2 (2.9)	
There should be caution in replacing important people tasks with technology because new technology can break down or get disconnected	67	3.57	--	7 (10.4)	20 (29.9)	35 (52.2)	5 (7.5)	
You get overwhelmed with how much you need to know to use the latest technology	68	2.54	5 (7.4)	34 (50.0)	19 (27.9)	7 (10.3)	3 (4.4)	
The hassles of getting new technology to work for you usually make it not worthwhile	67	2.37	4 (6.0)	44 (65.7)	10 (14.9)	8 (11.9)	1 (1.5)	
Technology always seems to fail at the worst possible time	67	3.03	--	16 (23.9)	35 (52.2)	14 (20.9)	2 (3.0)	
Overall Discomfort Subscale Mean	69	2.77	sd .46					

Insecurity Subscale

Responses to the items which make up the insecurity subscale produced a mean of 2.97 ($n = 68$, $sd = .45$) which reflects that these residents have relatively neutral attitudes when it comes to their distrust of technology having agreed with some statements and disagreed with others. For example, 68.7% of respondent disagreed or strongly disagreed with the item “any transaction you do electronically should be confirmed later with something in writing”, while 60.3% agreed or strongly agreed with the item “it can be risky to switch to a revolutionary new technology too quickly, and 60.3% of respondents were non-committal when it came to the statement “a computer is going to be a lot more reliable in doing a task than a person”. Table 4 summarizes the responses to the items in this subscale.

Table 4. Insecurity Subscale Responses

Question	N	Mean	SD	D	N	A	SA
You worry that information you send over the internet will be seen by other people	68	2.81	4 (5.9)	27 (39.7)	18 (26.5)	16 (23.5)	3 (4.4)
Any transaction you do electronically should be confirmed later with something in writing	67	2.31	5 (7.5)	41 (61.2)	16 (23.9)	5 (7.5)	--
Whenever something gets automated, you need to check	68	3.09	1 (1.5)	21 (30.9)	17 (25.0)	29 (42.6)	--

carefully that the computer is not making mistakes								
The human touch is very important when doing business	68	3.82	--	7 (10.3)	10 (14.7)	39 (57.4)	12 (17.6)	
If you provide information via technology, you can never be sure it really gets to the right place	67	2.69	3 (4.5)	33 (49.3)	13 (19.4)	18 (26.9)	--	
It can be risky to switch to a revolutionary new technology too quickly	68	3.53	--	10 (14.7)	17 (25.0)	36 (52.9)	5 (7.4)	
A computer is going to be a lot more reliable in doing a task than a person*	68	3.12	1 (1.5)	9 (13.2)	41 (60.3)	15 (22.1)	2 (2.9)	
Technological innovations always seem to hurt a lot of people by making their skills obsolete	68	2.62	2 (2.9)	33 (48.5)	23 (33.8)	9 (13.2)	1 (1.5)	
Overall Insecurity Subscale Mean	68	2.97	sd .45					

*item is negatively worded and therefore is reverse scored when calculating the overall mean for the scale

The second instrument used in Technology Readiness Survey was comprised of 10 5-point Likert scale items (1 = ‘very unimportant’ to 5 = ‘very important’). This instrument which was designed specifically for this study gauged residents’ perceptions of the importance of computers in the work life of a physician.

Responses to the items on this survey reflect a very positive attitude towards the importance of using computers, with an overall mean score on the instrument of 4.46 (n = 68, sd = .44). For example, 94.2% of respondents felt that using a computer for “accessing clinical data” was either important or very important while 95.5% felt it was important or very important to use a computer for “scheduling patient appointments”. Respondent also felt that using computers to “perform statistical analysis on clinical or research data” (100%) and prepare presentations (98.5%) was also important or very important. Table 5 summarizes the responses to the items in this survey.

Table 5. Importance of Computers Responses

To what extent do you believe a computer is important to the following:	N	Mean	VU	U	N	I	VI
Documenting patient information	68	4.28	2 (2.9)	--	9 (2.9)	23 (33.8)	34 (50.0)
Accessing clinical data	68	4.62	1 (1.5)	1 (1.5)	2 (2.9)	15 (22.1)	49 (72.1)
Communicating with colleagues	67	4.19	--	4 (6.0)	6 (9.0)	30 (44.8)	27 (40.3)
Obtaining advice on a specific patient's diagnosis or therapy	68	4.09	--	3 (4.4)	10 (14.7)	33 (48.5)	22 (32.4)
Registering patients	68	4.49	1 (1.5)	1 (1.5)	2 (2.9)	24 (35.3)	40 (58.8)
Scheduling patient appointments	68	4.59	1 (1.5)	1 (1.5)	1 (1.5)	19 (27.9)	46 (67.6)
Writing	68	4.59	--	--	1 (1.5)	26 (38.2)	41 (60.3)
Submitting billing information	68	4.35	--	--	7 (10.3)	30 (44.1)	31 (45.6)

Preparing presentations	68	4.68	--	--	1 (1.5)	20 (29.4)	47 (69.1)
Performing statistical analysis on clinical or research data	67	4.76	--	--	--	16 (23.9)	51 (76.1)
Overall Mean	68	4.46	sd .44				

EMR Experience Survey

Twenty family medicine residents from across Canada responded to our invitation to complete the EMR Experience Survey resulting in 19 complete surveys. Residents from three universities participated: Memorial University (n = 5), Queen's University (n = 4), University of Manitoba (n = 10). Overall, the residents have a positive attitude towards EMRs with an overall mean score on the survey of 3.64 (n = 19, sd = .31).

The survey was administered after the residents had complete the first year of their family medicine residency and asked for the residents' opinions about the value of EMRs, usability, curriculum relevance, training, reaction to the specific EMR used, and intention to use EMRs in the future. The analysis of the data has been broken down into the four subscales or factors.

A strong majority of the residents who responded to the survey agreed or strongly agreed to statements about the positive value of EMRs. Respondents reported having difficulty using the software. The majority of respondents indicated that the EMR was different than other computer applications they have used. A high percentage of the residents felt that the design of the EMR they used during their rotation in family medicine needs more work. Most of the residents also felt that training for using the EMR would have been helpful. The majority of respondents also agreed or strongly agreed that training and related experience would be helpful when learning and using the EMRs. Finally, 78% of the respondents agreed or strongly agreed that they would begin their practice using an EMR. The percentage of respondents who either agreed or strongly agreed to particular items in the EMR Experience Survey are summarized in Table 6.

Table 6 Responses to EMR Experience Survey

Question	N	%
Value of EMRs		
The EMR is a necessary step in health care	15	83.4
Using an EMR would improve my work as a physician	18	100.0
Using an EMR would improve the care of patients	14	82.4
EMRs are an important part of the practice of medicine	17	89.5
EMRs are an important way to decrease the likelihood of medical error in practice	15	79.0
I would like to learn more about EMRs and their capabilities	13	72.3
Usability		
I found the EMR was easy to use	3	15.8
The EMR was similar to other computer applications that I have used	5	26.3
The design of the EMR needs more work	17	94.5
Curriculum Relevance		
Training for using the EMR would have been helpful	14	77.8
You find new technologies to be mentally stimulating	11	61.1

Training and Related Experience		
I have been exposed to a working EMR before entering medical school	3	15.8
My experience using computers helped me in using the EMR	16	88.9
Knowing how to use the World Wide Web helped me in using the EMR	9	50.0
My knowledge of technology helped me in using the EMR	14	77.8
Reaction to the specific EMR used		
My impression of an EMR changed because of my experience in my rotation in a positive way	7	38.9
My impression of an EMR changed because of my experience in my rotation in a negative way	3	16.7
Intention to use an EMRs in the future		
I plan to begin my practice using an EMR	14	77.7
I plan to use an EMR in my practice eventually	17	94.4

EMR System Used

Residents were also asked to indicate which EMR system they used during their first year. This was to help determine if family medicine residents' experiences with EMRs provided by different vendors impacts their perception of EMRs and their willingness to continue using the technology. Unfortunately due to the low response rate on this survey, in some cases only one resident reported using a particular EMR system. Therefore this data analysis is purely anecdotal. Table 7 summarizes the responses as to which EMR systems were used by the residents.

Table 7. EMR Systems Used by Residents

EMR System	N	%
Nightingale	1	(6.3)
Wolf	--	--
Xwave	--	--
Other_EMR	15	(93.8)
Other:		
Accuro	3	(23.1)
CIS	3	(23.1)
Eclipsys	1	(7.7)
Jonoke	1	(7.7)
P&P, Socrates	1	(7.7)
Sunrise	1	(7.7)
Didn't use EMR	2	(15.4)
Don't know	1	(7.7)

The responses to each of the items were analyzed using an ANOVA in order to determine if there were any significant differences based on the type of EMR the residents were exposed to during their first rotation in family medicine. However, given the low numbers involved, no trends were identified.

Discussion

Technology orientation

Respondents indicated a highly positive attitude towards technology, open to new advances and functionality. The Technology Readiness Survey was not repeated after the residents completed the first year of their family medicine rotation, so we are unable to match technology orientation to residents' reaction to the EMR. We are encouraged however by their apparent comfort level with technology. Residents also indicated that they believe computers were very important in the work life of a physician with an overall mean score of **4.46/5**.

Need for training

We note that 78% of respondents indicated a need for EMR training and most responded that they would like to learn more. Participants were asked before and after the EMR exposure if they found "new technology to be mentally stimulating". Sixty-five percent agreed or strongly agreed that they found "new technology to be mentally stimulating" after the EMR exposure. Only 16% of respondents indicated that they had been exposed to a working EMR before entering medical school. Arguably this indicates a need for training if students are to use EMRs effectively. Despite this low percentage, 38% of the residents who responded to the EMR Experience Survey indicated that their impression of an EMR changed in a positive way following their first year of the family medicine rotation.

Perceived value

Despite the low percentage (16%) of respondents that found the EMR easy to use, a large majority of participants believed that EMRs are a necessary step in health care and an important part of the practice of medicine. Eighty percent or higher agreed that the EMR would improve their work as physicians, and improve the care of patients. Seventy-nine percent of respondents also agreed that EMRs are an important way to decrease the likelihood of medical error in practice.

Prior experience

One of the intents of this study was to consider whether Gen Y's technical skills were transferable to EMRs. Even if some do find the user interface challenging, these Gen Y residents should have had enough experience with applications that the challenges would not be insurmountable and should not impact their intention to use an EMR when they begin their formal practice. Unlike the data from a previous study with 1st year medical student which refuted this expectation, residents' prior experience with computers and technology seems to help them adapt to the EMRs. Sixteen percent of respondents found the EMR easy to use and 26% found the EMR similar to other computer applications with which they were familiar.

The difference in these experiences may in part be due to the residents' prior knowledge of EMRs. Sixty-six percent of the respondents reported having prior knowledge of EMRs before completing the first year of their family medicine rotation. When asked if their experience using computers and their knowledge of technology helped them when using the EMR, a large majority of respondents agreed, 89% and 78% respectively.

Only 16% of these respondents had been exposed to a working EMR before entering medical school, but only 37% reported that this was the first time they have used a working EMR. This differs significantly from the data collected during the 1st year medical student study. Also, only 16% of the residents who responded to the EMR Experience Survey found the EMR easy to use.

This would lead us to believe that an understanding of the user's prior experience is one of the fundamental principles of user interface design. Thus, we suggest that the prior experience of Gen Y residents has not prepared them for the current crop of EMRs. Of those who responded, 96% agreed that "The design of the EMR needs work." For medical educators, this has consequence. If EMRs proliferate as has been predicted and they become an integral part of how healthcare is delivered, then educators must prepare students for their use. Since it cannot be taken for granted that Gen Y are just going to "get it" because of their extensive use of technology, educators must find a way of teaching medical information technology formally. If using a stethoscope is taught as a clinical skill, so too must be the use of an EMR.

Intention to use EMRs

Seventy-eight percent of those who responded to the EMR Experience Survey agreed that they plan to begin their practice using an EMR. Only one item produced a significant difference between those who plan to use an EMR in their practice and those who are not sure or do not intend to. One would hope that the benefits of using an EMR in improving their work as a physician will outweigh any barriers to using the EMRs for future residents as well.

Residents may have also been under the influence of some other predisposing factors which caused the positive intention and perceived value. Having a high degree of technical aptitude (allowing them to view the interface as relatively easy), or prior experience with EMRs (during which time they had already formed the intention to use EMRs in their eventual practice) are two such factors.

Conclusions

Family medicine residents would appreciate the opportunity to receive training in the use of EMRs as part of their rotation and to learn more about their capabilities. They also agree that training for using an EMR in the curriculum would be helpful. So few residents had had any exposure to a working EMR before entering medical school that it seems that this training should take place as early as the first year. The current state of EMR usability is problematic insofar as the user interface is relatively complex and unfamiliar, even to this intelligent and accomplished cohort. Both medical students and residents will require training prior to using EMRs as they are presently designed. Further work needs to be done on the part of EMR vendors to improve and simplify user interface, or redesign EMRs such that functionality progressively discloses its complexity.

We predict that failing to adequately prepare medical students to use EMRs will result in further resistance and delays in EMR uptake.

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